In the Claims

1 (Currently amended): A polynucleotide comprising a polynucleotide sequence encoding a mutant small subunit of a heat labile plant ADP glucose pyrophosphorylase (AGP) enzyme, or a fragment thereof, wherein said small subunit, or said fragment thereof, comprises a mutation in the N-terminal portion thereof wherein the amino acid corresponding to tyrosine at position 36 of wild type maize endosperm small subunit sequence is replaced by a cysteine, and wherein when said mutant small subunit, or said fragment thereof, is expressed with a large subunit of a plant AGP enzyme to form a mutant enzyme, said mutant enzyme exhibits increased heat stability when compared to a wild type form of said plant AGP enzyme.

2 (Currently amended): The polynucleotide according to claim 1, wherein said mutant small subunit, or said fragment thereof, is a maize endosperm AGP subunit.

3-4 (Cancelled).

5 (Withdrawn—Currently amended): The polynucleotide according to ~~claim 4~~ claim 2, wherein said mutant small subunit comprises the amino acid sequence shown in SEQ ID NO:4.

6 (Withdrawn): The polynucleotide according to claim 5, wherein said polynucleotide comprises the nucleotide sequence shown in SEQ ID NO:3.

7 (Currently amended): The polynucleotide according to ~~claim 3~~ claim 2, wherein said mutant small subunit, or said fragment thereof, comprises a further mutation wherein an amino acid is inserted between the serine amino acid at position 34 and the threonine amino acid at position 35 of the wild type maize endosperm AGP small subunit sequence.

8 (Cancelled).

9 (Original): The polynucleotide according to claim 7, wherein the inserted amino acid is a glutamine.

10 (Cancelled).

11 (Currently amended): The polynucleotide according to ~~claim 10~~ claim 9, wherein said mutant small subunit comprises the amino acid sequence shown in SEQ ID NO:8.

12 (Original): The polynucleotide according to claim 11, wherein said polynucleotide comprises the nucleotide sequence shown in SEQ ID NO:7.

13 (Withdrawn): The polynucleotide according to claim 7, wherein the inserted amino acid is a glutamic acid.

14 (Cancelled).

15 (Withdrawn—Currently amended): The polynucleotide according to ~~claim 14~~ claim 13, wherein said mutant small subunit comprises the amino acid sequence shown in SEQ ID NO:10.

16 (Withdrawn): The polynucleotide according to claim 15, wherein said polynucleotide comprises the nucleotide sequence shown in SEQ ID NO:9.

17 (Previously presented): The polynucleotide according to claim 1, wherein said polynucleotide comprises a polynucleotide sequence encoding a large subunit of a plant AGP enzyme.

18 (Previously presented): The polynucleotide according to claim 17, wherein said large subunit comprises a mutation that confers increased heat stability on an AGP enzyme or increased individual seed weight on a plant that comprises said large subunit.

19 (Original): The polynucleotide according to claim 18, wherein said large subunit comprises a heat stability (*HS*) mutation selected from the group consisting of *HS13*, *HS14*, *HS16*, *HS33*, *HS40*, *HS47*, *HS RTS 48-2*, *HS RTS 60-1*, *HS33F*, *HS33M*, *HS7+3*, *HS6+3*, *HS7+6*, and *HS7+6+3*.

20 (Withdrawn): A method for increasing resistance of a plant to heat stress conditions, said method comprising incorporating the polynucleotide of claim 1 into the genome of a plant and expressing the mutant small subunit AGP enzyme encoded by said polynucleotide, thereby increasing resistance of the plant to heat stress conditions.

21 (Withdrawn): The method according to claim 20, wherein said plant is a monocotyledonous plant.

22 (Withdrawn): The method according to claim 21, wherein said monocotyledonous plant is selected from the group consisting of rice, wheat, barley, oats, sorghum, maize, lily, and millet.

23 (Withdrawn): The method according to claim 20, wherein said plant is *Zea mays*.

24 (Withdrawn): The method according to claim 20, wherein said plant is a dicotyledonous plant.

25 (Withdrawn): The method according to claim 24, wherein said dicotyledonous plant is selected from the group consisting of pea, alfalfa, chickpea, chicory, clover, kale, lentil, soybean, tobacco, potato, sweet potato, radish, cabbage, rape, apple tree, and lettuce.

26 (Withdrawn): The method according to claim 20, wherein said plant comprises or expresses a large subunit of a plant AGP enzyme, wherein said large subunit comprises an amino acid mutation that confers increased heat stability or increased individual seed weight to a plant comprising or expressing said large subunit.

27-30 (Cancelled).

31 (Currently amended): A plant, plant tissue or cell comprising a polynucleotide comprising a polynucleotide sequence encoding a mutant small subunit of a heat labile plant ADP glucose pyrophosphorylase (AGP) enzyme, or a fragment thereof, wherein said small subunit, or said fragment thereof, comprises a mutation in the N-terminal portion thereof wherein the amino acid corresponding to tyrosine at position 36 of wild type maize endosperm small subunit sequence is replaced by a cysteine, and wherein when said mutant small subunit, or said fragment thereof, is expressed with a large subunit of a plant AGP enzyme to form a mutant enzyme, said mutant enzyme exhibits increased heat stability when compared to a wild type form of said plant AGP enzyme.

32 (Previously presented): The plant, plant tissue or cell according to claim 31, wherein said plant, plant tissue or cell is monocotyledonous.

33 (Previously presented): The plant, plant tissue or cell according to claim 32, wherein said monocotyledonous plant, plant tissue or cell is selected from the group consisting of rice, wheat, barley, oats, sorghum, maize, lily, and millet.

34 (Previously presented): The plant, plant tissue or cell according to claim 31, wherein said plant is *Zea mays* or said plant tissue or cell is from *Zea mays*.

35 (Previously presented): The plant, plant tissue or cell according to claim 31, wherein said plant, plant tissue or cell is dicotyledonous.

36 (Previously presented): The plant, plant tissue or cell according to claim 35, wherein said dicotyledonous plant, plant tissue or cell is selected from the group consisting of pea, alfalfa, chickpea, chicory, clover, kale, lentil, soybean, tobacco, potato, sweet potato, radish, cabbage, rape, apple tree, and lettuce.

37 (Previously presented): The plant, plant tissue or cell according to claim 31, wherein said plant tissue is a seed.

38 (Previously presented): The plant, plant tissue or cell according to claim 31, wherein said plant, plant tissue or cell comprises or expresses a large subunit of a plant AGP enzyme, wherein said large subunit comprises an amino acid mutation that confers increased heat stability or increased individual seed weight to a plant comprising or expressing said large subunit.

39-42 (Cancelled).

43 (Currently amended): A composition comprising:

i) a polynucleotide comprising a polynucleotide sequence encoding a mutant small subunit of a heat labile plant ADP glucose pyrophosphorylase (AGP) enzyme, or a fragment thereof, wherein said small subunit, or said fragment thereof, comprises a mutation in the N-terminal portion thereof wherein the amino acid corresponding to tyrosine at position 36 of wild type maize endosperm small subunit sequence is replaced by a cysteine, and wherein when said mutant small subunit, or said fragment thereof, is expressed with a large subunit of a plant AGP enzyme to form a mutant enzyme, said mutant enzyme exhibits increased heat stability when compared to a wild type form of said plant AGP enzyme; and

ii) a polynucleotide comprising a polynucleotide sequence that encodes a large subunit of a plant AGP enzyme.

44 (Previously presented): The composition according to claim 43, wherein said large subunit comprises a mutation that confers increased heat stability on an AGP enzyme or increased individual seed weight on a plant that comprises said large subunit.

45 (Previously presented): The composition according to claim 44, wherein said large subunit comprises a heat stability (HS) mutation selected from the group consisting of *HS13, HS14, HS16, HS33, HS40, HS47, HS RTS 48-2, HS RTS 60-1, HS33F, HS33M, HS7+3, HS6+3, HS7+6,* and *HS7+6+3*.

46-59 (Cancelled).

60 (Withdrawn): A method for preparing a plant having an AGP enzyme that exhibits increased stability relative to a wild type AGP enzyme said method comprising introducing a polynucleotide as defined in claim 1 into a plant cell and growing a plant from said plant cell; or breeding a plant comprising a polynucleotide as defined in claim 1 with another plant of the same species and obtaining progeny that comprise said polynucleotide.

61 (Withdrawn): The method according to claim 60, wherein said plant grown from said plant cell is selected for expression of said polynucleotide.

62 (Withdrawn): The method according to claim 60, wherein said plant is a monocotyledonous plant.

63 (Withdrawn): The method according to claim 22, wherein said monocotyledonous plant is selected from the group consisting of rice, wheat, barley, oats, sorghum, maize, lily, and millet.

64 (Withdrawn): The method according to claim 60, wherein said plant is *Zea mays*.

65 (Withdrawn): The method according to claim 60, wherein said plant is a dicotyledonous plant.

66 (Withdrawn): The method according to claim 65, wherein said dicotyledonous plant is selected from the group consisting of pea, alfalfa, chickpea, chicory, clover, kale, lentil, soybean, tobacco, potato, sweet potato, radish, cabbage, rape, apple tree, and lettuce.

67 (Withdrawn): The method according to claim 60, wherein said plant comprises or expresses a large subunit of a plant AGP enzyme, wherein said large subunit comprises an amino acid mutation that confers increased heat stability or increased individual seed weight to a plant comprising or expressing said large subunit.

68-71 (Cancelled).

72 (Currently amended): An expression construct comprising a polynucleotide comprising a polynucleotide sequence encoding a mutant small subunit of a heat labile plant ADP glucose pyrophosphorylase (AGP) enzyme, or a fragment thereof, wherein said small subunit, or said fragment thereof, comprises a mutation in the N-terminal portion thereof wherein the amino acid corresponding to tyrosine at position 36 of wild type maize endosperm small subunit sequence is replaced by a cysteine, and wherein when said mutant small subunit, or said fragment thereof, is expressed with a large subunit of a plant AGP enzyme to form a mutant enzyme, said mutant enzyme exhibits increased heat stability when compared to a wild type form of said plant AGP enzyme.

73-86 (Cancelled).

87 (New): The composition according to claim 43, wherein said mutant small subunit, or said fragment thereof, is a maize endosperm AGP subunit.

88 (New): The composition according to claim 87, wherein said mutant small subunit comprises the amino acid sequence shown in SEQ ID NO:4.

89 (New): The composition according to claim 88, wherein said polynucleotide comprises the nucleotide sequence shown in SEQ ID NO:3.

90 (New): The composition according to claim 87, wherein said mutant small subunit, or said fragment thereof, comprises a further mutation wherein an amino acid is inserted between the serine amino acid at position 34 and the threonine amino acid at position 35 of the wild type maize endosperm AGP small subunit sequence.

91 (New): The composition according to claim 90, wherein the inserted amino acid is a glutamine.

92 (New): The composition according to claim 91, wherein said mutant small subunit comprises the amino acid sequence shown in SEQ ID NO:8.

93 (New): The composition according to claim 92, wherein said polynucleotide comprises the nucleotide sequence shown in SEQ ID NO:7.

94 (New): The composition according to claim 90, wherein the inserted amino acid is a glutamic acid.

95 (New): The composition according to claim 94, wherein said mutant small subunit comprises the amino acid sequence shown in SEQ ID NO:10.

96 (New): The composition according to claim 95, wherein said polynucleotide comprises the nucleotide sequence shown in SEQ ID NO:9.